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Title : Remotely sensed satellite data used to quantify factors that drive foraging in northern elephant seals (Mirounga angustirostris): Oceanography vs. Bathymetry.

Category : Ecology

Student : M.A./M.S.

Preferred Format : Either Oral or Poster Presentation

Abstract : Northern elephant seals spend up to 10 months a year foraging in the North Pacific. Sexual segregation of foraging behavior has been hypothesized based on qualitative differences in foraging location and dive data. It was hypothesized that males dive benthically while females forage mesopelagically. This study used remotely sensed satellite data to look quantitatively at the behavior of males and females in relation to ocean depth, sea surface temperature (SST) and SST gradient. Using satellite tracks and dive data from 6 adult males and 7 adult females from 1995 and 1996; we calculated a diving index (DI) by subtracting mean maximum dive depth (m) from ocean depth (m) at each location. Behavior of animals at sea was divided into foraging and non-foraging based on transit speed between locations (foraging = transit speed <0.4m/s). When foraging the mean DI for males (747 ± 568 m, mean ± SD) was significantly less than for females (3,192 ± 688 m). Conversely on non-foraging dives there was no significant difference between sexes. This clearly demonstrates that bathymetry is a key factor in determining male foraging behavior. To address what factors drive female foraging behavior, tracks of 7 adult females were examined in conjunction with remotely sensed satellite data for SST and SST gradient. We found 6 out of 7 females were in colder water when foraging than when not foraging. Of these six females, 3 were also in areas of higher SST gradient when foraging. One potential problem with the analyses is that the temporal scale of behavioral changes is much smaller than the temporal scale of remotely sensed oceanographic data. However, even at this gross scale thermal structure appears to be an important factor driving foraging in northern elephant seal females.